

February 29, 1956

Dear Dick:

Sincerely,

Rust

Burt

Enclosures:

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Monthly Progress Report No. 9

System No. 3

Contract No. A-101

4 January 1956 to 4 February 1956

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1-0. GENERAL. During the period covered by this report, some manufacturing drawings were prepared and the construction of some of the sub-assemblies has been started.

2-0. ANTENNA.

2-1. A network has been devised to transform the impedance presented to the preamplifier by the antenna and transmission line. The impedance transformation results in an improved preamplifier noise figure over the entire [redacted] Design and construction of the network, accomplished during this report period, was facilitated by the availability of the full-scale antenna and aircraft nose section.

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2-2. The feasibility of using a non-flush antenna during system flight tests is being investigated. Using a commercially available non-flush antenna would eliminate the necessity of making major structural modifications on the flight-test aircraft.

3-0. PREAMPLIFIER.

3-1. To provide a better heat-sink arrangement, and to eliminate the need for neutralization, a new version of the preamplifier has been designed. The modified preamplifier employs the 6299 in a grounded-grid circuit, instead of in the grounded-cathode circuit used formerly. An additional stage of amplification, employing a 6021, is required to compensate for the lower gain of the grounded-grid stage.

3-2. During the next report period, a layout of the modified preamplifier will be completed, and a plug-in card version will be built and tested.

4-0. R-F ASSEMBLY.

4-1. A modified etched-board assembly has been built and successfully tested, both as a unit, and with the breadboard model of the i-f amplifier. Because the etched board contains the circuitry for the lowest and highest bands (1, 7, and 9), no circuit problems are expected in the remaining bands.

4-2. Since major changes in layout were required for proper operation of the board for bands 1, 7, and 9, complete revision of board art work was necessary. The art work has been revised and new boards are being fabricated for use in the prototype receiver. Assembling and testing the boards is scheduled for completion by the end of the next report period. It will then be necessary to test the three boards in conjunction with the r-f preamplifier.

5-0. I-F ASSEMBLY. This assembly is scheduled for delivery by a subcontractor by the end of the next report period.

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6-0. SWEEP ASSEMBLY.

6-1. Test and modification of the circuits for the sweep assembly has begun.

6-2. Crystal control of the maximum and minimum frequencies of the sweeping oscillator has been proven practicable. The circuits which effect this control will be subjected to further refinement.

7-0. RECORDER. Commercial notch filters, for use in removing frequencies near 1000 cps from the audio output of the channel 1 receiver, are too large to fit on the recorder board assembly. Therefore, a bridged-tee filter has been designed to remove the 1000-cps component, and the network will be mounted on a small board below the main chassis of the receiver.

8-0. TEST SET.

8-1. The high-frequency test oscillators have been built and tested. The final design uses a single tube, instead of nine separate circuits. Signal levels between 100,000 and 0.3 microvolts are obtained through a calibrated attenuator.

8-2. The low-frequency oscillator unit (employing 16 crystals) is being adapted for operation in conjunction with the pulse-decoding section of the test set.

9-0. MECHANICAL DESIGN.

9-1. A set of manufacturing drawings (including detail parts) for the r-f assembly has been completed, and a set of parts is now being fabricated. In order to minimize drafting time, assembly records will be maintained by means of photographs and marked reproducible prints of the original art work.

9-2. Due to recent circuit changes in the sweep assembly, the parts density in this assembly will be greater than in the other assemblies. A somewhat more complex package will probably be necessary.

9-3. Details of the top and bottom receiver covers have been released for bids. Associated details of the hold-downs and venting system are being drawn.

9-4. A main chassis plate, incorporating all of the known mounting provisions, is being fabricated. The plate is intended for development and test purposes, and the chassis plate for the prototype will be fabricated on the basis of this developmental model. With the exception of the chassis plate, detail structural drawings for the prototype are scheduled for release in ten days. A wooden mock-up has been ordered, and is scheduled for delivery about 1 March.

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10-0. PLANNING. During the next interval, the major effort will be directed toward construction of those portions of the prototype whose design has been completed. In addition, every effort will be made to complete the breadboard-model sweep assembly testing and to design a suitable package for this assembly.

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